



Effects of Real Objects and Posters on Academic Performance in ... Ahmed, I. & Mahmud, M. Y. Et. al. (2026)

Effects of Real Objects and Posters on Academic Performance in Biology among Secondary School Students in Katsina State, Nigeria

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Abstract

This study examines the Effects of Real objects and Posters on Biology Students' Academic Performance in Secondary Schools of Katsina State. Two research objectives formulated were answered by two research questions, and two null hypotheses tested at a 0.05 level of significance. The research design for the study was quasi-experimental consist of three groups; Real objects, Posters and control groups that were randomly selected from 24 secondary schools in Katsina and adapted pretest, posttest non-Equivalent experimental control group design. The adapted biology performance test (BPT) was validated by the researcher's supervisor and other professionals in the Department of Biology and Science education. Cronbach alpha reliability coefficient of 0.71 was Obtained as the reliability coefficient of the research instrument. The data collected were analyzed by using descriptive statistics (Mean and standard deviation) and inferential statistics (Independent t-test was used for testing the null hypotheses formulated. The findings from this study revealed there is Significant difference between the experimental and control groups in terms of academic performance of the students exposed to Real object and Posters where the Real object and Picture groups significantly performed better than the control groups. The study concluded, the students who were taught using Real object and Posters elevates student learning and performance of the students in the Control group. It was recommended among others that; teachers should be supervised to ensure frequent use of Real object and Posters in their day-to-day teaching exercise.

Keywords: Academic Performance, Real object Posters, Biology

Introduction

The term Education in general is essential and basic component for attaining overall national development. It is in line with this that the National Policy on Education (FRN, 2014) states that, education should aim at the integration of individuals to become sound and effective citizens and provision of equal opportunities for all citizens of the nation. The word education comes from the Latin word e-ducere, mean "to lead out". It is indeed, difficult to define education. Education is a relentless process of becoming. To the human being we educate and to the animal we train. The development of a nation is not measured through the buildings it has built, the roads it has laid down, bridges it has constructed but by the human resources, the nation has developed through a well-defined system of education. Although the physical facilities are usually important, they are perishable and valuable. In the absence of proper education, the nation can hardly develop these and maintain them. Science Education deals with sharing of science contents and process with individuals who are not primarily considered to be member of the scientific community in order for them to understand science and utilize such knowledge for self and others benefit. Generally, members not part of scientific community consists of individuals who could be students, farmers, market women or a whole community Arlington, (2017). However, science education as conceived in



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the context of this paper has to do with students undergoing training in sciences, be it in secondary or tertiary institutions of learning. Science education could be viewed as a process of teaching or training especially, within the school system to improve one's knowledge about the environment and to develop one's skill of systematic enquiry as well as natural attitudinal characteristics. Biology as a branch of the general body of knowledge (science), has been defined by different scientists according to perception and understanding of the subject. Okwo (2020) define Biology as a science which involves systematic study of living things and interaction with each other and their environment. Kalu (2023) simply defines Biology as the science of life. Biology as a science of life is concerned with the characteristics of living things, their forms, functions and relationship with one another and with their environment among others. However, for effective Biology teaching, the use of Real object and Posters which would make the use of the environment would achieve much and bring home the actual meaning of Biology. Biology is one of the elective subjects in the Key Learning Area (KLA) of Science Education.

Academic performance refers to as the level at which a student, teacher or institution has managed to reach their educational goals. Academic Performance is the extent to which a learner is profiting from instructions in a given area of learning, that is to say that achievement is reflected by the extent to which skill or knowledge has been imparted to him. In relation to skills acquisition, Adebule (2016) observes that improving students' abilities, and fostering student's scientific literacy are the ultimate goal of Biology. In order to achieve the goal, some steps must be taken such as training students to acquire science process skills. Real object is a teaching material method that uses real-life objects, artefacts, or materials to enhance students' learning experiences. These objects can be anything from everyday items like coins, maps, or newspapers to specialized things like scientific equipment or cultural artefacts. Real object are objects from real life used to improve students' understanding of other cultures and real-life situations in classroom instruction (Aggarawal 2018). Real object refers to authentic objects from real life that one uses in the classroom to teach a specific concept. Real object can be both physical and virtual, as long as it is something used in the real world. It can make the learning experience more memorable and create connections between objects and topic of discussion. One of the benefits of using Real object in classroom is that, it helps make it easier for young learners to recall information. A Picture is a temporary promotion of an idea, product, or event put up in a public space for mass consumption. Typically, Posters include both textual and graphic elements, although a Picture may be either wholly graphical or wholly text. Posters are designed to be both eye-catching and informative. Posters may be used for many purposes. They are a frequent tool of advertisers (particularly of events, musicians, and films), propagandists, protestors, and other groups trying to communicate a message. Posters are also used for reproductions of artwork, particularly famous works, and are generally low-cost compared to the original artwork. The modern Picture, as we know it, however, dates back to the 1840s and 1850s when the printing industry perfected colour lithography and made mass production possible. Picture can highly effective in humanities sources and have been shown to improve metacognitive practice too (Musah 2017).

Statement of the Problem

This study is inspired in response to students' persistent poor performance in some Areas in Biology. Perhaps this can be partly ascribed to inadequate teaching and instructional methods adopted by Biology teachers. Students' failure in Senior Secondary School West Africa Examination Council (WAEC) and National Examination Council (NECO) is becoming rampant in which only few candidates obtain the requirement for further studies into Nigerian higher institutions. Therefore, learners need to be instructed using proper instructional materials, regarding the teaching and



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learning process. This prompted the desire to investigate how the REAL OBJECT and Posters will be used in teaching and learning of the concept of Digestive system in biology among Senior Secondary Schools in Katsina Zonal Education Quality Assurance, Katsina State, Nigeria.

Objectives of the Study

The following objectives were set to guide the study:

1. Determine the effect of Real object on Biology students' academic performance in secondary school in secondary school
2. Examine the effect of Posters on Biology students' academic performance in secondary school

Research Hypothesis

The following null hypotheses were formulated and tested at 0.05 level of significance:

1. There is no significant difference in mean students' academic performance scores when taught the Digestive system using Real object and those taught with the conventional method in secondary school.
2. There is no significant difference in mean students' academic performance scores when taught Biology using Posters and those taught with conventional method in secondary school.

Research Methodology

This study employed a pre-test post-test quasi-experimental, control group design. There are three groups. The first group is the experimental group one (EG₁) was treated using real object, the second group is the experimental group two (EG₂) which was treated using posters while the last group is the control (CG) that was exposed to conventional method. All the three groups were pretested (O₁) to ensure the participants are not significantly different in academic performance. The two experimental groups that received treatment (X₁) were post tested (O₂) to determine the effect of treatment on students' academic performance

Population and Sample

The population for this study consisted of all Senior Secondary School two (SSII) Biology students in Katsina zonal education quality assurance. The schools consisted of all of public schools that offer Biology within the Katsina zonal education quality assurance. The schools consist of one (1) all boys school, two (2) all-girls school and twenty-one (21) co-educational secondary schools that make twenty-four (24) schools in all. The number of male students was 8,748 and female students has 7,174 making a total population of 15,922, all the schools have the same characteristics in terms of ownership, calendar, syllabus and scheme of work. The sample of the study covered a total number of 125 SSII students comprised 67 males and 58 females from the 3 public senior secondary schools in Katsina. To select a representative sample for this study, the education zone was clustered in three local Government Areas. From each of the cluster, a simple random sampling technique was used and three sampled schools from the list of the co-educational schools only thereby isolating the single-gender schools. The random sampling was carried out using balloting. Intact classes were placed as the first experimental, second experimental and control group.

Instrument for Data Collection

The instrument used for data collection is Biology performance Test (BPT) which consist of 25 items multiple choice question lettered A-D. The items were obtained from a collection of West African Examination Council (WAEC) and National Examinations Council (NECO) past assessment items on Biology. The items cover the entire unit taught by the researcher on the area of Digestive System and are in line with the National Biology Syllabus for SSII. To ascertain the validity of the adapted BPT, the researcher submitted the initial draft of BPT to the researcher's supervisor and other professionals in the department of education for content as well as face validity. The

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recommendations made by these experts were used to modify the final version of the instrument. The instrument's reliability coefficient 0.71 was determined through the use of Cronbach Alpha and it ensured the measurement of internal consistency of the instrument to be use. The responses of the students in the Biology Performance Test (BPT) were scored using the marking scheme. The research questions were answered using descriptive statistics (Mean and standard deviation) while the null hypotheses were tested at 0.05 level using inferential statistics. Specifically, null hypotheses 1&2 were tested using independent sampled t-test. The choice for independent t-test is due to the fact that, t-test assesses significant difference between independent groups.

Presentation of Results

Hypothesis One

There is no significant difference in mean students' academic performance scores when taught Digestive system using Real object and those taught with conventional method in secondary school. Table 1: t-test Analysis of Academic Performance of Students taught Biology using Real object and those taught using conventional method

Table 1: t-test Analysis between Students' performance in Experimental and Control Groups 1

Grouping	N	Mean	Std. Deviation	T	Df	p-value	Decision
Posters	73	69.45	15.10	7.68	140	<0.001	Significant
Control	69	47.55	18.76				

Significant at P is less than 0.05

Table 1 presents the t-test Analysis of academic performance of Biology students taught using Real object method. From the results, the t-value recorded is 7.68 while the p-value calculated at degree of freedom of 140 is 0.001. P-value is less than 0.05 and therefore null hypothesis which stated that there is no significant difference in mean students' academic performance scores when taught Biology using Real object and those taught with conventional method is rejected. There for students taught using Real object performed significantly better than those taught using conventional method.

Hypothesis two

There is no significant difference in mean students' academic performance scores when taught Biology using Posters and those taught with conventional method in secondary school.

Table 2: t-test Analysis of Academic Performance of Students taught Digestive system using Posters and those taught using conventional method

Table 2: t-test Analysis between Students' performance in Experimental and Control Groups 2

Grouping	N	Mean	Std. Deviation	t	df	p-value	Decision
Posters	73	69.45	15.10	7.68	140	<0.001	Significant
Control	69	47.55	18.76				

Significant at P is less than 0.05

Table 2 presents t-test Analysis of academic performance of Biology students taught using Posters method. From the results, the t-value recorded is 7.68 while the p-value calculated at degree of freedom of 74 is 0.001. P-value is less than 0.05 and therefore null hypothesis which stated that there is no significant difference in mean students' academic performance scores when taught Biology using Posters and those taught with conventional method is rejected. Therefore, students taught using Posters performed significantly better than those taught using conventional method.

Summary of the Findings

From the result presented in this study, the summary of the major findings as follows:



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1. Students taught using Real objects recorded the highest mean score than students exposed to conventional method. Therefore, there is significant difference in mean students' Academic performance scores when taught Digestive system using Real objects and those taught with conventional method.
2. Students taught using Posters recorded the highest mean score than students exposed to conventional method. Therefore, there is significant difference in the mean students' Academic performance scores when taught Digestive system using Posters and those taught with conventional method.

Discussion of Findings

The study reveals that there is significant effect of Real object and Posters on students' Academic performance in biology. Both Real object and Posters have equal potential to elevate students' academic performance in biology. This finding corroborates with numerous previous studies on the effect of Real object and Posters and other instructional materials across various subjects taught in secondary schools.

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